

Sodium in Groundwater

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What is sodium?

Sodium is a highly soluble chemical element with the symbol “Na.” Sodium is often naturally found in groundwater.

In water, sodium has no smell but it can be tasted by most people at concentrations of 200 milligrams per litre (mg/L) or more. Within British Columbia the ambient concentration of sodium in groundwater ranges from a few mg/L to over 100 mg/L. High concentrations of sodium in groundwater occur naturally in some areas. For example, on the Gulf Islands sodium levels have been shown to range up to thousands of mg/L depending upon the location and depth of the well. An increase in sodium in groundwater above ambient or natural levels may indicate pollution from point or non-point sources. The Canadian drinking water quality guideline for sodium is an Aesthetic Objective (OA) of 200 mg/L.

What are the known sources of sodium?

All groundwater contains some sodium because most rocks and soils contain sodium compounds from which sodium is easily dissolved. The most common sources of elevated sodium levels in groundwater are:

- Erosion of salt deposits and sodium bearing rock minerals
- Naturally occurring brackish water of some aquifers
- Salt water intrusion into wells in coastal areas
- Infiltration of surface water contaminated by road salt
- Irrigation and precipitation leaching through soils high in sodium
- Groundwater pollution by sewage effluent
- Infiltration of leachate from landfills or industrial sites.

What are the environmental health concerns?

Sodium is a principal chemical in bodily fluids, and it is not considered harmful at normal levels of intake from combined food and drinking water sources. However, increased intake of sodium in drinking water may be problematic for people with hypertension, heart disease or kidney problems that require them to follow a low sodium diet. Individuals on sodium restricted diets may want to discuss concerns related to sodium intake from drinking water with their doctor.

Other information sources:

Health Canada,
Guidelines for Canadian
Drinking Water Quality
Supporting Documents.
“Sodium.” (Dec 1992)
http://www.health-sc.gc.ca/ehp/ehd/catalogue/bch_pubs/dwg_sup_doc/sodium.pdf

British Columbia
Ministry of Health
Services, Health File
#45. “Should I Get My
Well Water Tested?”
(Jun 1995)
<http://www.healthservices.gov.bc.ca/hlthfile/hfile45.html>



Where have high sodium levels been found in BC well water?

The Ministry of Water, Land and Air Protection evaluated the results of groundwater samples obtained through the *Water Quality Check Program* carried out between 1977 and 1993. Over 2,100 samples were analysed for sodium concentration, of which 5% had sodium levels exceeding the drinking water aesthetic objective of 200 mg/L. Some rural wells near the communities of Gabriola Island, Hornby Island, Ladysmith, Lantzville, Saltspring Island and Williams Lake were found to have sodium concentrations above the guidelines for Canadian drinking water quality.

What can well owners and water purveyors¹ do about sodium contamination of well water?

Sodium is not removed by pitcher-type filtration units or boiling, which may in fact concentrate it further. Water treatment methods such as distillation, or reverse osmosis are the only effective methods of sodium removal, though these may be expensive for use in small water systems. Homeowners should ensure that any water treatment product used has been certified for the specified purpose by the National Sanitation Foundation (NSF).

Monitoring and upkeep of the treatment system is critical and all manufacturer's instructions should be followed carefully. High sodium concentrations may be discovered more easily than other water quality concerns due to the taste of sodium chloride and sodium sulphate in water at levels above the drinking water

British Columbia communities near locations of rural wells found to have high sodium levels.



guidelines. Proper well site selection and construction is critical to prevent contamination of wells with sodium from surface sources such as irrigation, or sewage discharges. Proper handling, storage and use of road salt will also minimize groundwater contamination. Water conservation measures, particularly in summer months when groundwater recharge is lowest, may reduce the risk of salt water intrusion in coastal areas.

Well water testing and source protection

Well owners are encouraged to test their water periodically to ensure the water is safe to drink. Consult your local public health inspector (see the Blue Pages of your local telephone book) regarding the specific parameters to test for and how often testing should be done.

For more information on protecting your well water source a *Well Protection Toolkit* is available from the Ministry of Water, Land and Air Protection on the internet: http://wlapwww.gov.bc.ca/wat/gws/well_protection/wellprotect.html to help water purveyors and communities develop a well protection plan to minimize the threat of land use activities on groundwater quality.

¹A water purveyor is a person, corporation or municipality that supplies water for domestic purposes.